

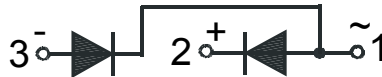
## High Voltage Diode Module (TRACTION - PAC™)

PSTKD 82

$I_{FRMS} = 180 \text{ A}$   
 $I_{FAVM} = 82 \text{ A}$   
 $V_{RRM} = 600-1800 \text{ V}$

Preliminary Data Sheet

$V_{RSM}$ V	$V_{RRM}$ V	Type
700	600	PSTKD 82/06
900	800	PSTKD 82/08
1100	1000	PSTKD 82/10
1300	1200	PSTKD 82/12
1500	1400	PSTKD 82/14
1700	1600	PSTKD 82/16
1900	1800	PSTKD 82/18



### Features

- International standard package, JEDEC TO-240 AA
- Direct Copper Bonded  $Al_2O_3$  -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~

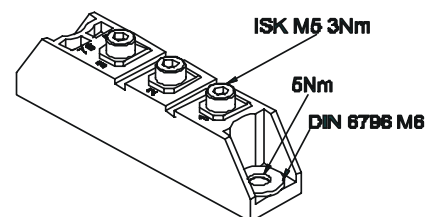
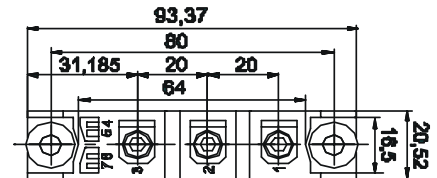
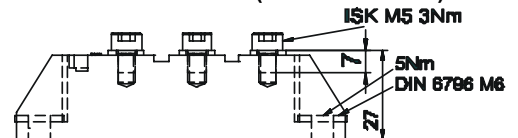
### Applications

- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

### Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

### Dimensions in mm (1 mm = 0.0394")



Symbol	Test Conditions	Maximum Ratings	
$I_{FRMS}$ $I_{FAVM}$	$T_{VJ} = T_{VJM}$ $T_C = 110^\circ\text{C}; 180^\circ \text{ sine}$	180 82	A A
$I_{TSM}$	$T_{VJ} = 45^\circ\text{C};$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	1700 A
		$t = 8.3 \text{ ms (60 Hz)}$	1950 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	1530 A
		$t = 8.3 \text{ ms (60 Hz)}$	1740 A
$di/dt$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	14450 $A^2s$
		$t = 8.3 \text{ ms (60 Hz)}$	15700 $A^2s$
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	11700 $A^2s$
		$t = 8.3 \text{ ms (60 Hz)}$	12500 $A^2s$
$T_{VJ}$		-40 ... 125	$^\circ\text{C}$
$T_{VJM}$		125	$^\circ\text{C}$
$T_{stg}$		-40 ... 125	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $t = 1 \text{ min}$	3000	V~
	$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	3600	V~
$M_d$	Mounting torque (M5)	5.0/44	Nm/lb.in.
	Terminal connection torque (ISK M5)	3.0/26	Nm/lb.in.
Weight	Typical including screws	56	g

Symbol	Test Conditions	Characteristic Values	
$I_{RRM}$ , $I_{DRM}$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	15	mA
$V_T$	$I_T = 200 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.74	V
$V_{T0}$	For power-loss calculations only ( $T_{VJ} = T_{VJM}$ )	0.8	V
$r_T$	$T_{VJ} = T_{VJM}$	2.7	$m\Omega$
$Q_S$	$T_{VJ} = 125^\circ\text{C}; I_F = 50 \text{ A}, -di/dt = 3 \text{ A}/\mu\text{s}$	170	$\mu\text{C}$
$I_{RM}$		45	A
$R_{thJC}$	per diode; DC current	0.35	K/W
	per module	0.18	K/W
$R_{thJK}$	per diode; DC current	0.55	K/W
	per module	0.275	K/W
$d_S$	Creeping distance on surface	12.7	mm
$d_A$	Creepage distance in air	9.6	mm
$a$	Maximum allowable acceleration	50	$m/s^2$

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.

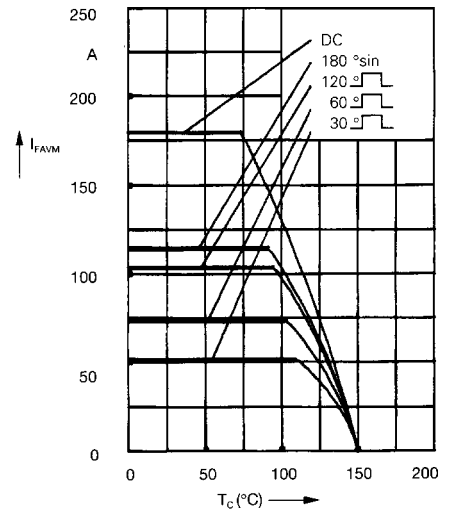
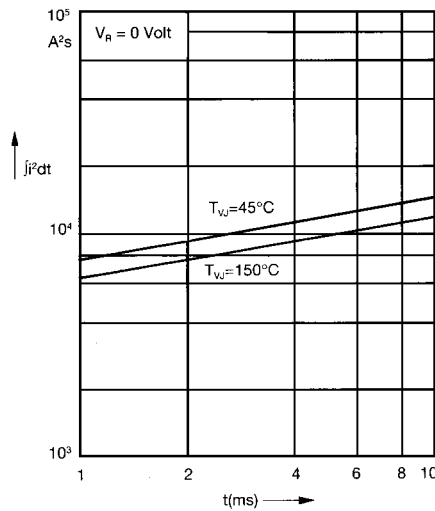
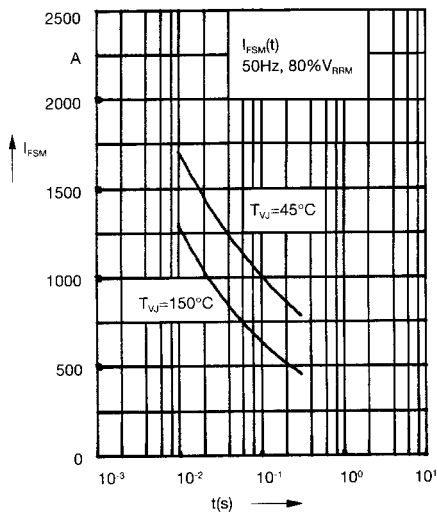


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

Fig. 2  $\int i^2 dt$  versus time (1-10 ms)

Fig. 2a Maximum forward current at case temperature

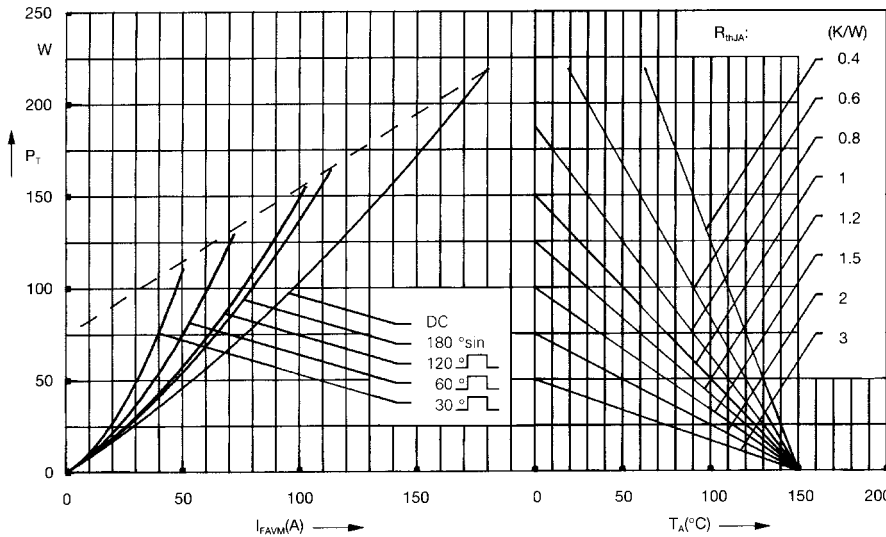


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

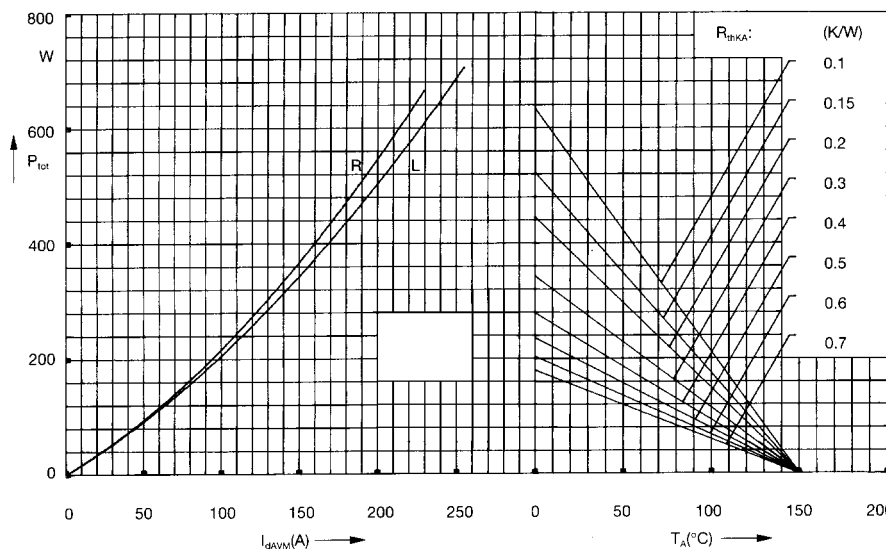


Fig. 4 Single phase rectifier bridge:  
 Power dissipation versus direct output current and ambient temperature  
 R = resistive load  
 L = inductive load

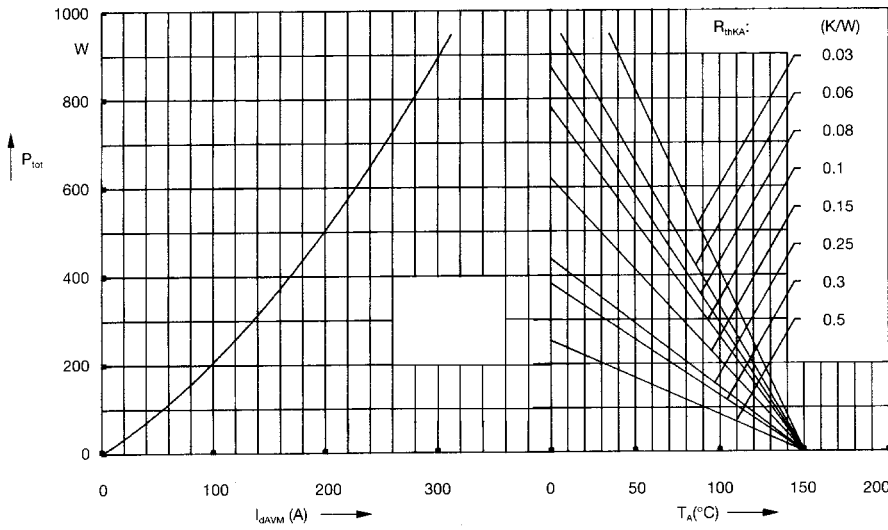


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

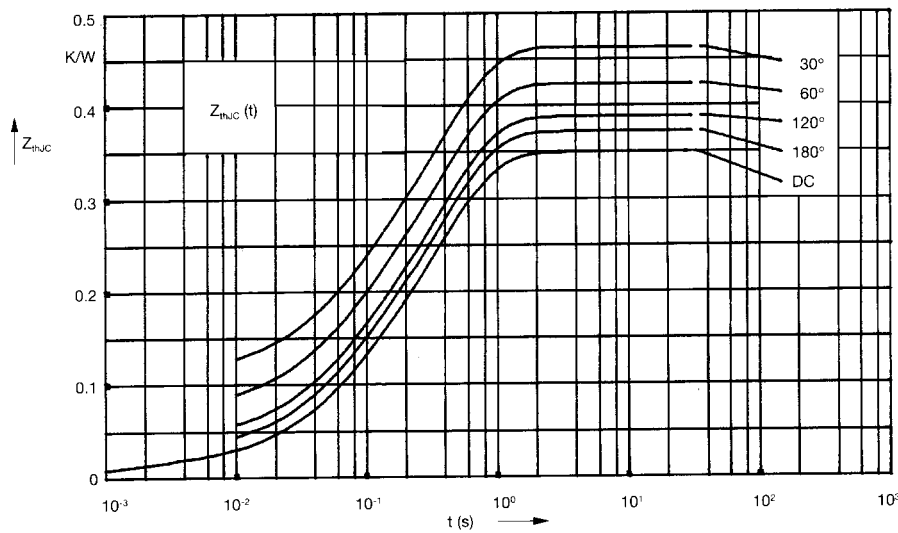


Fig. 6 Transient thermal impedance junction to case (per diode)

$R_{thJC}$  for various conduction angles d:

d	$R_{thJC}$ (K/W)
DC	0.35
180°	0.37
120°	0.39
60°	0.43
30°	0.47

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.013	0.0014
2	0.072	0.062
3	0.265	0.375

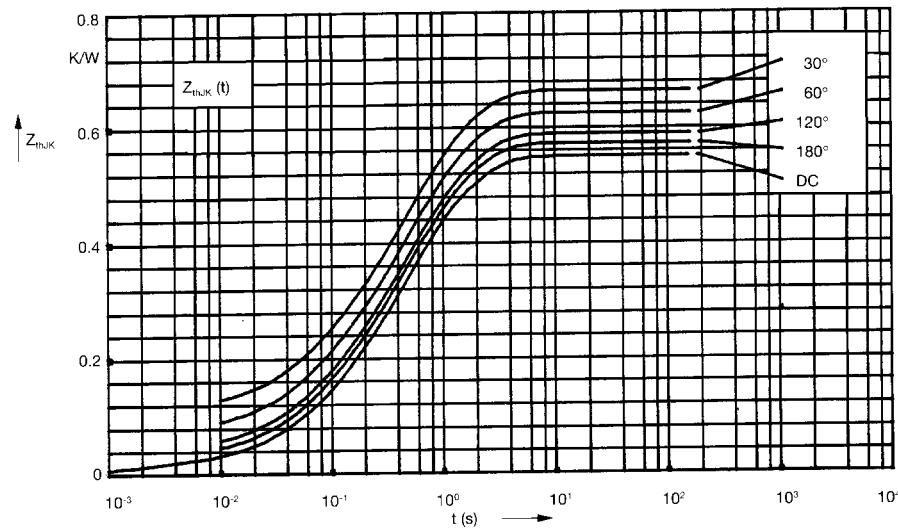


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$  for various conduction angles d:

d	$R_{thJK}$ (K/W)
DC	0.55
180°	0.57
120°	0.59
60°	0.63
30°	0.67

Constants for  $Z_{thJK}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.013	0.0014
2	0.072	0.062
3	0.265	0.375
4	0.2	1.32